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FROM	:	Oleg F. Kaplun, Esq. of Fay Kaplun & Marcin, LLP
DATE	:	August 9, 2006
SUBJECT	:	US Patent Appln. Serial No. 09/930,672 for *Totally Embedded FGS Video Coding with Motion Compensation* Phillips Ref.: US 010212 Our Ref.: 40160/004701

NUMBER OF PAGES INCLUDING COVER : 21

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Attorney Docket No. 40160/04701

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s)	:	Van Der Schaar et al.
Serial No.	:	09/930,672
Filing Date	:	August 15, 2001
For	:	Totally Embedded FGS Video Coding with Motion Compensation
Group Art Unit:	:	2621
Examiner	:	Allen Wong

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By: Oleg F. Kaplun, (Reg. No 45,559) Date: August 9, 2006

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In support to the Notice of Appeal filed July 11, 2006 transmitted herewith please find an Appeal Brief for filing in the above-identified application. Please charge the Credit Card of **Fay Kaplun & Marcin, LLP** in the amount of $500.00 (PTO-Form 2038 is enclosed herewith). The Commissioner is hereby authorized to charge the **Deposit Account of Fay Kaplun & Marcin, LLP NO. 50-1492** for any additional required fees. A copy of this paper is enclosed for that purpose.

Respectfully submitted,

Dated: August 9, 2006

By: ______________________
Oleg F. Kaplun, Reg. 45,559

Attorney Docket No. 40160/04701

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Respectfully submitted,

Dated: August 9, 2006

By: ______________________
Oleg F. Kaplun, Reg. 45,559

Serial No.: 09/930,672
Group Art Unit: 2621
Attorney Docket No.: US 010212

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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In re Application of:

Van Der Schaar et al.

Serial No.: 09/930,672

Filed: August 15, 2001

For: TOTALLY EMBEDDED FGS VIDEO CODING WITH MOTION COMPENSATION

Group Art Unit: 2621

Examiner: Allen Wong

Board of Patent Appeals and Interferences

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APPEAL BRIEF UNDER 37 C.F.R. § 41.37

In support of the Notice of Appeal filed July 11, 2006, and pursuant to 37 C.F.R. § 41.37, Appellants present their appeal brief in the above-captioned application.

This is an appeal to the Board of Patent Appeals and Interferences from the Examiner's final rejection of claims 1-36 in the final Office Action dated April 12, 2006. The appealed claims are set forth in the attached Claims Appendix.

08/10/2006 MBINAS 00000001 09930672
01 FC:1402 500.00 OP

1. Real Party in Interest

This application is assigned to Philips Electronics North America Corporation, the real party in interest.

2. Related Appeals and Interferences

There are no other appeals or interferences which would directly affect, be directly affected, or have a bearing on the instant appeal.

3. Status of the Claims

Claims 1-36 have been rejected in the final Office Action. The final rejection of claims 1-36 is being appealed.

4. Status of Amendments

All amendments submitted by the Appellants have been entered.

5. Summary of Claimed Subject Matter

The present invention, as recited in claim 1, relates to a method of coding video. Specifically, the present invention describes a method that encodes an uncoded video (streams entering subtractor 45 and motion estimator 43) to generate extended base layer reference frames (streams entering frame memory 60). (See Specification, p. 7, ll. 1-3; Fig. 4). Each of the extended base layer reference frames include a base layer reference frame 31 and at least a fractional bitplane of an associated enhancement layer reference frame 32. (See Id., p. 7, ll. 3-6; Fig. 3A). Frame residuals (stream exiting subtractor 45) are generated from the uncoded video and the extended base layer reference frames. (See Id., p. 7, ll. 7-9; Fig. 4).

The present invention, as recited in claim 7, relates to a method of decoding a compressed video having a base layer stream and an enhancement layer stream. Specifically, the present invention describes a method that decodes the base layer (stream entering base layer decoder 71) and enhancement layer streams (stream entering enhancement layer decoder 72) to generate extended base layer reference frames. (See Id., p. 10, ll. 11-23; Fig. 6). Each of the extended base layer reference frames (streams entering frame memory 77) include a base layer

reference frame 31 and at least a fractional bitplane of an associated enhancement layer reference frame 32. (See Id., p. 10, ll. 11-23; Figs. 3A, 6). Frame residuals (stream exiting inverse DCT 83) are predicted from the extended base layer reference frames. (See Id., p. 11, ll. 3-14; Fig. 6).

The present invention, as recited in claim 13, relates to a memory medium for coding video. Specifically, the present invention describes code for encoding an uncoded video (streams entering subtractor 45 and motion estimator 43) to generate extended base layer reference frames (streams entering frame memory 60). (See Id., p. 7, ll. 1-3; Fig. 4). Each of the extended base layer reference frames include a base layer reference frame 31 and at least a fractional bitplane of an associated enhancement layer reference frame 32. (See Id., p. 7, ll. 3-6; Fig. 3A). The present invention also describes code for predicting frame residuals (stream exiting subtractor 45) from the uncoded video and the extended base layer reference frames. (See Id., p. 7, ll. 7-9; Fig. 4).

The present invention, as recited in claim 19, relates to a memory medium for decoding a compressed video having a base layer stream and an enhancement layer stream. Specifically, the present invention describes code for decoding the base layer (stream entering base layer decoder 71) and enhancement layer streams (stream entering enhancement layer decoder 72) to generate extended base layer reference frames. (See Id., p. 10, ll. 11-23; Fig. 6). Each of the extended base layer reference frames (streams entering frame memory 77) include a base layer reference frame 31 and at least a fractional bitplane of an associated enhancement layer reference frame 32. (See Id., p. 10, ll. 11-23; Figs. 3A, 6). The present invention also describes code for predicting frame residuals (streams entering frame memory 77) from the extended base layer reference frames. (See Id., p. 11, ll. 3-14; Fig. 6).

The present invention, as recited in claim 25, relates to an apparatus for coding video. Specifically, the apparatus comprises means for encoding (encoders 41, 42) an uncoded video (streams entering subtractor 45 and motion estimator 43) to generate extended base layer reference frames (streams entering frame memory 60). (See Id., p. 7, ll. 1-3; Fig. 4). Each of the extended base layer reference frames include a base layer reference frame 31 and at least a fractional bitplane of an associated enhancement layer reference frame 32. (See Id., p. 7, ll. 3-6; Fig. 3A). The apparatus also comprises means for predicting (encoders 41, 42) frame residuals (stream exiting subtractor 45) from the uncoded video and the extended base layer reference frames. (See Id., p. 7, ll. 7-9; Fig. 4).

The present invention, as recited in claim 31, relates to an apparatus for decoding a compressed video having a base layer stream and an enhancement layer stream. Specifically, the apparatus comprises means for decoding (decoders 71, 72) the base layer (stream entering base layer decoder 71) and enhancement layer streams (stream entering enhancement layer decoder 72) to generate extended base layer reference frames. (See Id., p. 10, ll. 11-23; Fig. 6). Each of the extended base layer reference frames (streams entering frame memory 77) include a base layer reference frame 31 and at least a fractional bitplane of an associated enhancement layer reference frame 32. (See Id., p. 10, ll. 11-23; Figs. 3A, 6). The apparatus also comprises means for predicting (decoders 71, 72) frame residuals (streams entering frame memory 77) from the extended base layer reference frames. (See Id., p. 11, ll. 3-14; Fig. 6).

6. Grounds of Rejection to be Reviewed on Appeal

I. Whether claims 1-36 are unpatentable under 35 U.S.C. § 103(a) as unpatentable over U.S. Pat. No. 6,510,177 (De Bonet) in view of U.S. Pat. No. 6,614,936 (Wu).

II. Whether claims 1, 3, 7, 13, 15, 19, 25, 27, and 31 are unpatentable under the judicially created doctrine of obviousness-type double patenting over claims 1, 5, and 9-12 of copending Application No. 09/793,035 ('035 Application).

7. Argument

I. The Rejection of Claims 1-36 Under 35 U.S.C. § 103(a) as Being Unpatentable Over De Bonet in view of Wu Should Be Reversed.

A. The Examiner's Rejection

In the final Office Action, the Examiner rejected claims 1-36 under 35 U.S.C. § 103(a) as being unpatentable over De Bonet in view of Wu. (See 4/12/06 *Office Action*, p. 7, ll. 23-24).

De Bonet discloses a system and method for encoding, transmitting, decoding, and storing a high-resolution video sequence using a low-resolution base layer and a higher-resolution enhancement layer. (See De Bonet, abstract). A base layer module receives and downsamples a high-resolution video sequence, encodes the resultant low-resolution video using

a low-resolution encoder, and outputs a low-resolution encoded base layer that can be decoded by a conventional video decoder. (See Id., col. 10, ll. 10-14). De Bonet incorporates motion vectors. These motion vectors are not computed internally, but use pre-calculated "downsampled" motion vectors computed from the high-resolution video sequence.

Wu discloses a video encoding scheme that employs progressive fine-granularity layered coding to encode video data frames into multiple layers, including a base layer of comparatively low quality video and multiple enhancement layers of increasingly higher quality video. (See Wu, abstract). In Wu, the minimum number of bits needed to represent the maximum value m in a binary format dictates the number of enhancement layers for each block. With n bit planes, n enhancement layers are encoded using variable length coding. (See Id., col. 9, ll. 54-58).

B. The Cited Patents Do Not Disclose Extended Base Layer Reference Frames Including A Base Layer Reference Frame And At Least A Fractional Bitplane Of An Associated Enhancement Layer Reference Frame as Recited in Claim 1.

The Examiner asserts that De Bonet discloses "each of the extended base layer reference frames including a base layer reference frame and at least a *portion* of an associated enhancement layer reference frame." (See 4/12/06 *Office Action*, p. 8, ll. 3-13). However, since De Bonet does not use a portion of an associated enhancement layer reference frame, the Examiner's claim is unfounded.

As discussed above in the Summary of Claimed Subject Matter, the portion of the associated enhancement layer reference frame is a fractional bitplane. Consequently, the portion of the associated enhancement layer reference frame is one or more bitplanes or fractional bit-planes of the associated enhancement layer reference frame. (See Specification, p. 7, ¶ [0028]). Those skilled in the art understand that bitplanes or fractional bitplanes are an actual part of the associated enhancement layer reference frame. In contrast, De Bonet uses motion vectors for the encoding process. The motion vectors of De Bonet are not internally computed but are pre-calculated from the high-resolution video sequence. (See De Bonet, col. 10, ll. 21-24). That is, the motion vectors are not an actual part of the high-resolution video sequence. They are merely derivatives created from the high-resolution video sequence. The motion vectors that are

initially pre-calculated are used throughout De Bonet, whether it is low-resolution or high-resolution. (See Id.,col. 10, ll. 37-41). In fact, De Bonet specifically states that these motion vectors differentiates it from conventional compressors. (See Id., col. 10, ll. 19-21). Thus, DeBonet neither teaches nor suggests "each of the extended base layer reference frames including a base layer reference frame and at least a *portion* of an associated enhancement layer reference frame" as recited in claim 1.

Furthermore, the Examiner correctly stated that De Bonet does not specifically disclose the fractional bit plane of an associated enhancement layer reference frame, as recited in claim 1. The Examiner attempted to cure this deficiency with Wu. However, Wu does not cure the above described deficiencies of De Bonet. Wu merely describes bitplanes that are encoded in enhancement layers using variable length coding. The encoding of bitplanes and using a bitplane from an associated enhancement layer reference frame are in two separate fields of endeavor. Wu teaches using bit planes to determine the number of enhancement layers for each block in order to encode the bitplanes. Wu still maintains conventional methods of encoding in that the multiple enhancement layers may be used (in addition to the base layer) as a reference to predict the subsequent enhancement layer. That is, Wu does not include fractional bitplanes of an associated enhancement layer reference frame in the base layer reference frame, as recited in claim 1. In contrast, the present invention teaches and recites the use of bitplanes from an enhancement layer that are included in the base layer reference frame (thereby creating the extended base layer reference frames) in order to increase the quality of a base layer.

Thus, it is respectfully submitted that neither De Bonet nor Wu, either alone or in combination, discloses or suggests "extended base layer reference frames including a base layer reference frame and at least a fractional bitplane of an associated enhancement layer reference frame," as recited in claim 1. Accordingly, it is respectfully submitted that claim 1 is allowable. Because claims 2-6 depend from and, therefore, include all the limitations of claim 1, it is respectfully submitted that these claims are also allowable.

Independent claims 7, 13, 19, 25, and 31 also recite "extended base layer reference frames including a base layer reference frame and at least a fractional bitplane of an associated enhancement layer reference frame." Thus, it is respectfully submitted that these claims are also allowable. Because claims 8-12, 14-18, 20-24, 26-30, and 32-36 depend from

and, therefore, include all the limitations of allowable claims, it is respectfully submitted that these claims are also allowable.

II. The Rejection of Claims 1, 3, 7, 13, 15, 19, 25, 27, and 31 Under The Judicially Created Doctrine of Obviousness-Type Double Patenting Over Claims 1, 5, And 9-12 Of The '035 Application Should Be Reversed.

A. The Examiner's Rejection

In the final Office Action, the Examiner rejected claims 1, 3, 7, 13, 15, 19, 25, 27, and 31 under the judicially created doctrine of obviousness-type double patenting over claims 1, 5, and 9-12 of copending Application No. 09/793,035. (See 4/12/06 *Office Action*, p. 6, ll. 25-27).

The Examiner correctly stated that the conflicting claims are not identical. However, the Examiner stated that the claims are not patentably distinct from each other because the combination of claims 1 and 3 of the present application is equivalent to claim 1 of the '035 Application. The Examiner put forth a similar rejection for claims 25 and 27 of the present application over claim 9 of the '035 Application, claims 13 and 15 of the present application over claim 11 of the '035 Application, claim 7 of the present application over claim 5 of the '035 Application, claim 19 of the present application over claim 12 of the '035 Application, and claim 31 of the present application over claim 10 of the '035 Application.

B. The '035 Application Does Not Recite Generating Residual Images Using Extended base Layer Frames Which Each Include At Least A Fractional Bitplane Of An Associated Enhancement Layer Reference Frame As Recited in Claim 1.

The Examiner asserts that through simple "tweaking" of the wording of the claims 1 and 3 of the present application would be an obvious variation of the invention defined in claim 1 of the '035 Application. (See 4/12/06 *Office Action*, p. 2, ll. 16-20). Furthermore, through a combination with Wu, the fractional bit plane recitation of claims 1 and 3 of the present application would also be obvious. However, Applicants assert that the invention

disclosed in the present application differs enough to not be an obvious variation of the invention disclosed in the '035 Application.

Claim 1 of the present application recites "encoding an uncoded video to generate extended base layer reference frames, each of the extended base layer reference frames including a base layer reference frame and at least a fractional bitplane of an associated enhancement layer reference frame" and "generating frame residuals from the uncoded video and the extended base layer reference frames." Claim 3 of the present application recites "coding the frame residuals with a fine granular scalable codec to generate fine granular scalable enhancement layer frames." Claim 1 of the '035 Application recites "coding a portion of the video data to produce base layer frames," "generating residual images from the video data and the base layer frames utilizing multiple base layer frames for each of the residual images," and "coding the residual images with a fine granular scalability technique to produce enhancement layer frames."

As can be seen from the above recitations, claim 1 of the '035 Application generates residual images using multiple *base layer frames*. In contrast, claims 1 and 3 of the present application generates residual images using *extended* base layer frames which each include at least a fractional bitplane of an associated *enhancement layer reference frame*. Thus, the generation of the residual images differs in the source from which they are created. Those skilled in the art understand that using base layer frames differs with using extended base layer frames, especially when they include at least a fractional bitplane of an associated enhancement layer reference frame. That is, an extended base layer frame has been manipulated (*i.e.*, fractional bitplane included) so that it no longer has the same properties as a base layer frame. It appears the Examiner fails to address these differences in the double patenting obviousness-type rejection. Even assuming the basis is the same, as discussed above, the bitplanes of Wu combined with the '035 Application would not teach the present application. To reiterate, Wu merely describes bitplanes that are encoded in enhancement layers using variable length coding. Those skilled in the art understand that the encoding of bitplanes and using a bitplane from an associated enhancement layer reference frame are in two separate fields of endeavor. Wu concerns using bit planes to determine the number of enhancement layers for each block in order to encode the bitplanes. In contrast, the present invention uses bitplanes from an enhancement layer in order to increase the quality of a base layer. The same arguments may be put forth with

respect to the combination of claims 25 and 27, the combination of claims 13 and 15, claim 7, claim 9, and claim 31.

Thus, it is respectfully submitted that claims 1, 3, 7, 13, 15, 19, 25, 27, and 31 are not an obvious variation of the invention defined in the claims of the '035 Application. Accordingly, it is respectfully submitted that these claims are therefore allowable.

8. Conclusions

For the reasons set forth above, Appellants respectfully request that the Board reverse the final rejection of the claims by the Examiner under the judicially created doctrine of obviousness-type double patenting and under 35 U.S.C. § 103(a), and indicate that claims 1-36 are allowable.

Please direct all future correspondence to:

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Respectfully submitted,

Dated: August 9, 2006

By: ______________________

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New York, NY 10038

CLAIMS APPENDIX

1. (Rejected) A method of coding video, comprising the steps of:

encoding an uncoded video to generate extended base layer reference frames, each of the extended base layer reference frames including a base layer reference frame and at least a fractional bitplane of an associated enhancement layer reference frame; and

generating frame residuals from the uncoded video and the extended base layer reference frames.

2. (Rejected) A method of coding video according to claim 1, further comprising the step of coding the frame residuals with a scalable codec selected from the group consisting of DCT based codecs or wavelet based codecs to generate enhancement layer frames.

3. (Rejected) A method of coding video according to claim 1, further comprising the step of coding the frame residuals with a fine granular scalable codec to generate fine granular scalable enhancement layer frames.

4. (Rejected) A method of coding video according to claim 1, wherein the frame residuals include B frame residuals.

5. (Rejected) A method of coding video according to claim 4, wherein the frame residual further include P frame residuals.

6. (Rejected) A method of coding video according to claim 1, wherein the frame residual include P frame residuals.

7. (Rejected) A method of decoding a compressed video having a base layer stream and an enhancement layer stream, the method comprising the steps of:

decoding the base layer and enhancement layer streams to generate extended base layer reference frames, each of the extended base layer reference frames including a base layer reference frame and at least a fractional bitplane of an associated enhancement layer reference

frame; and

predicting frame residuals from the extended base layer reference frames.

8. (Rejected) A method of decoding video according to claim 7, further comprising the step of decoding the frame residuals with scalable decoding selected from the group consisting of DCT based decoding or wavelet based decoding.

9. (Rejected) A method of decoding video according to claim 8, further comprising the steps of:

generating enhancement layer frames from the frame residuals; and

generating an enhanced video from the base layer frames and the enhancement layer frames.

10. (Rejected) A method of decoding video according to claim 7, wherein the frame residuals include B frame residuals.

11. (Rejected) A method of decoding video according to claim 10, wherein the frame residuals further include P frame residuals.

12. (Rejected) A method of decoding video according to claim 7, wherein the frame residuals include P-frame residuals.

13. (Rejected) A memory medium for coding video, the memory medium comprising:

code for encoding an uncoded video to generate extended base layer reference frames, each of the extended base layer reference frames including a base layer reference frame and at least a fractional bitplane of an associated enhancement layer reference frame; and

code for predicting frame residuals from the uncoded video and the extended base layer reference frames.

14. (Rejected) A memory medium for coding video according to claim 13, further comprising code for scalable encoding the frame residuals.

15. (Rejected) A memory medium for coding video according to claim 13, further comprising code for fine granular scalable encoding the frame residuals.

16. (Rejected) A memory medium for coding video according to claim 13, wherein the frame residuals include B frame residuals.

17. (Rejected) A memory medium for coding video according to claim 16, wherein the frame residuals further include P frame residuals.

18. (Rejected) A memory medium for coding video according to claim 13, wherein the frame residuals include P frame residuals.

19. (Rejected) A memory medium for decoding a compressed video having a base layer stream and an enhancement layer stream, the memory medium comprising:

code for decoding the base layer and enhancement layer streams to generate extended base layer reference frames, each of the extended base layer reference frames including a base layer reference frame and at least a fractional bitplane of an associated enhancement layer reference frame; and

code for predicting frame residuals from the extended base layer reference frames.

20. (Rejected) A memory medium for decoding a compressed video according to claim 19, further comprising code for scalable decoding the frame residuals, the code for scalable decoding selected from the group consisting of DCT based code or wavelet based code.

21. (Rejected) A memory medium for decoding a compressed video according to claim 20, further comprising:

code for generating enhancement layer frames from the frame residuals; and

code for generating an enhanced video from the base layer frames and the enhancement layer frames.

22. (Rejected) A memory medium for decoding a compressed video according to claim 19, wherein the frame residuals include B frame residuals.

23. (Rejected) A memory medium for decoding a compressed video according to claim 22, wherein the frame residuals further include P frame residuals.

24. (Rejected) A memory medium for decoding a compressed video according to claim 19, wherein the frame residuals include P frame residuals.

25. (Rejected) An apparatus for coding video, the apparatus comprising:

means for encoding an uncoded video to generate extended base layer reference frames, each of the extended base layer reference frames including a base layer reference frame and at least a fractional bitplane of an associated enhancement layer reference frame; and

means for predicting frame residuals from the uncoded video and the extended base layer reference frames.

26. (Rejected) An apparatus for coding video according to claim 25, further comprising means for scalable encoding the frame residuals.

27. (Rejected) An apparatus for coding video according to claim 25, further comprising code for fine granular scalable encoding the frame residuals.

28. (Rejected) An apparatus for coding video according to claim 25, wherein the frame residuals include B frame residuals.

29. (Rejected) An apparatus for coding video according to claim 28, wherein the frame residuals further include P frame residuals.

30. (Rejected) An apparatus for coding video according to claim 25, wherein the frame residuals include P frame residuals.

31. (Rejected) An apparatus for decoding a compressed video having a base layer stream and an enhancement layer stream, the apparatus comprising:

means for decoding the base layer and enhancement layer streams to generate extended base layer reference frames, each of the extended base layer reference frames including a base layer reference frame and at least a fractional bitplane of an associated enhancement layer reference frame; and

means for predicting frame residuals from the extended base layer reference frames.

32. (Rejected) An apparatus for decoding a compressed video according to claim 31, further comprising scalable decoding means for decoding the frame residuals, the scalable decoding means selected from the group consisting of DCT based decoding means or wavelet based decoding means.

33. (Rejected) An apparatus for decoding a compressed video according to claim 32, further comprising:

means for generating enhancement layer frames from the frame residuals; and

means for generating an enhanced video from the base layer frames and the enhancement layer frames.

34. (Rejected) An apparatus for decoding a compressed video according to claim 31, wherein the frame residuals include B frame residuals.

35. (Rejected) An apparatus for decoding a compressed video according to claim 34, wherein the frame residuals further include P frame residuals.

36. (Rejected) An apparatus for decoding a compressed video according to claim 31, wherein the frame residuals include P frame residuals.

Serial No.: 09/930,672
Group Art Unit: 2621
Attorney Docket No.: US 010212

EVIDENCE APPENDIX

No evidence has been entered or relied upon in the present appeal.

RELATED PROCEEDING APPENDIX

No decisions have been rendered regarding the present appeal or any proceedings related thereto.